

Claims

We claim:

1. A corn seed mixture comprising

5 a) corn seed from a first corn line comprising a dominant loss-of-function *sh2* allele; and

 b) corn seed from a second corn line comprising a functional or semi-functional *sh2* or wild type *Sh2* allele, wherein said second corn line is a genetically male sterile corn line.

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2. The corn seed mixture according to claim 1, wherein said corn seed from said first corn line comprises from about 0.1% to about 50% of said corn seed mixture.

15 3. The corn seed mixture according to claim 1, wherein said corn seed from said first corn line comprises from about 1% to about 50% of said corn seed mixture.

4. The corn seed mixture according to claim 1, wherein said corn seed from said first corn line comprises from about 1% to about 25% of said corn seed mixture.

20 5. The corn seed mixture according to claim 1, wherein said corn seed from said first corn line comprises from about 1% to about 15% of said corn seed mixture.

6. The corn seed mixture according to claim 1, wherein said corn seed from said first corn line comprises from about 1% to about 10% of said corn seed mixture.

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7. The corn seed mixture according to claim 1, wherein said corn seed from said first corn line comprises about 0.1%, 0.2%, 0.3%, 0.4%, 0.5%, 0.6%, 0.7%, 0.8%, 0.9%, 1%, 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 11%, 12%, 13%, 14%, 15%, 16%, 17%, 18%, 19%, 20%, 21%, 22%, 23%, 24%, 25%, 26%, 27%, 28%, 29%, 30%, 31%, 32%, 33%, 34%, 30 35%, 36%, 37%, 38%, 39%, 40%, 41%, 42%, 43%, 44%, 45%, 46%, 47%, 48%, 49%, or 50% of said corn seed mixture.

8. The corn seed mixture according to claim 1, wherein said corn seed from said first corn line comprises about 5% of said corn seed mixture and said corn seed from said second corn line comprises about 95% of said corn seed mixture.

5 9. The corn seed mixture according to any preceding claim, wherein said corn seed from said second corn line comprises one or more genes that provide for desirable eating attributes or phenotype.

10 10. The corn seed mixture according to claim 9, wherein said gene that provides for desirable eating attributes or phenotype is a gene associated with or responsible for thin pericarp phenotype.

15 11. The corn seed mixture according to any preceding claim, wherein said first corn line or said second corn line or both said first and second corn line is homozygous for a recessive *sugary (su1)* allele.

20 12. The corn seed mixture according to any preceding claim, wherein said first corn line or said second corn line or both said first and second corn line is homozygous for a *sh2-i* allele.

25 13. A method for producing a corn plant having kernels with increased sucrose content, said method comprising planting a corn seed mixture according to any preceding claim and growing corn plants from said corn seed mixture and allowing for pollination of said corn plants to occur wherein corn ears produced by said pollinated plants comprise kernels exhibiting increased sucrose content.

30 14. A method for producing a corn plant having kernels with increased sucrose content, said method comprising planting seed of a first corn line that comprises a dominant loss-of-function *sh2* allele, and planting seed of a second corn line that contains a functional or semi-functional *sh2* allele or wild type *Sh2* allele, wherein said corn seed of said first corn line is planted in a separate row from corn seed of said second corn line, growing corn plants from said planted corn seed, wherein corn plants grown from said seed of said second corn line are made male sterile, and allowing for pollination of said corn plants to occur wherein

only the plants grown from the first corn line can act as a pollinator of plants grown from the second corn line, and wherein corn ears produced by said pollinated plants comprise kernels exhibiting increased sucrose content.

5 15. The method according to claim 14, wherein a corn plant grown from said seed of said second corn line is made male sterile by mechanical or hand detasseling.

10 16. The method according to claim 14, wherein a corn plant grown from said corn seed of said second corn line is made male sterile by chemical means.

15 17. The method according to claim 14, wherein six to eight rows of corn seed from said second corn line is planted followed by planting a single row of corn seed from said first corn line, wherein rows of corn seed from said second corn line and a row of corn seed from said first corn line are planted in an alternating fashion.

20 18. A corn plant, corn plant tissue, or corn plant seed produced according to the methods of any of claims 13-17.

25 19. The corn plant, corn plant tissue, or corn plant seed according to claim 18, wherein said corn plant, corn plant tissue, or corn plant seed comprises a *sugary* (*sul*) allele in a homozygous state.

20 20. The corn plant, corn plant tissue, or corn plant seed according to claim 18, wherein said corn plant, corn plant tissue, or corn plant seed comprises an *sh2-i* allele in a homozygous state.

25 21. The corn plant, corn plant tissue, or corn plant seed according to any of claims 18-20, wherein said corn plant tissue is an ear of corn.

30 22. A corn plant, corn plant tissue, or corn plant seed comprising a dominant loss-of-function *sh2* allele.

23. The corn plant, corn plant tissue, or corn plant seed according to claim 22, wherein said corn plant, corn plant tissue, or corn plant seed further comprises a *Rev6* mutation in an *sh2* allele.

5 24. The corn plant, corn plant tissue, or corn plant seed according to claim 22, wherein said corn plant, corn plant tissue, or corn plant seed further comprises a mutation conferring heat stability in an *sh2* allele.

10 25. The corn plant, corn plant tissue, or corn plant seed according to claim 24, wherein said mutation conferring heat stability is an *HS33* mutation.

15 26. The corn plant, corn plant tissue, or corn plant seed according to claim 22, wherein said corn plant, corn plant tissue, or corn plant seed comprises more than one copy of said dominant loss-of-function *sh2* allele.

27. A corn cell or protoplast having an *Sh2* allele and transformed with a plant *Sh2* gene or a fragment thereof, wherein expression of said *Sh2* allele is inhibited or silenced.

28. A plant seed comprising a dominant loss-of-function *sh2* allele, said plant seed
20 designated as Sil.*Sh2*.

29. A method for producing a corn plant having a dominant loss-of-function *sh2* genotype, said method comprising transforming a corn plant cell or corn protoplast having an *Sh2* allele with a nucleic acid comprising a plant *Sh2* gene or a fragment thereof; growing a
25 plant from said transformed plant cell; and screening said plant for inhibition or silencing of expression of said *Sh2* allele.

30. The method according to claim 29, wherein said plant is selfed or bred with another plant and seed obtained therefrom.